

FORM PTO-1390 (Modified)  
(REV 11-2000)

U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

ATTORNEY'S DOCKET NUMBER

## TRANSMITTAL LETTER TO THE UNITED STATES

214502US0PCT

DESIGNATED/ELECTED OFFICE (DO/EO/US)

U.S. APPLICATION NO. (IF KNOWN, SEE 37 CFR

CONCERNING A FILING UNDER 35 U.S.C. 371

09/926609

INTERNATIONAL APPLICATION NO.

INTERNATIONAL FILING DATE

PRIORITY DATE CLAIMED

PCT/FR00/01424

25 May 2000

25 May 1999

TITLE OF INVENTION

TRANSPARENT GLAZING AND ITS USE IN A DOOR OF A REFRIGERATED ENCLOSURE, ESPECIALLY ONE HAVING A VACUUM GLAZING UNIT

APPLICANT(S) FOR DO/EO/US

MESSERE Rino et al.

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☒ This is an express request to begin national examination procedures (35 U.S.C. 371(f)). The submission must include items (5), (6), (9) and (24) indicated below.
4. ☒ The US has been elected by the expiration of 19 months from the priority date (Article 31).
5. ☒ A copy of the International Application as filed (35 U.S.C. 371 (c) (2))
  - a. ☐ is attached hereto (required only if not communicated by the International Bureau).
  - b. ☒ has been communicated by the International Bureau.
  - c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
- ☒ An English language translation of the International Application as filed (35 U.S.C. 371(c)(2)).
  - a. ☒ is attached hereto.
  - b. ☐ has been previously submitted under 35 U.S.C. 154(d)(4).
- ☒ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371 (c)(3))
  - a. ☐ are attached hereto (required only if not communicated by the International Bureau).
  - b. ☐ have been communicated by the International Bureau.
  - c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
  - d. ☒ have not been made and will not be made.
- ☐ An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
- ☐ An oath or declaration of the inventor(s) (35 U.S.C. 371 (c)(4)).
- ☐ An English language translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371 (c)(5)).
- ☐ A copy of the International Preliminary Examination Report (PCT/IPEA/409).
- ☒ A copy of the International Search Report (PCT/ISA/210).

## Items 13 to 20 below concern document(s) or information included:

13. ☐ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
14. ☐ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
15. ☒ A **FIRST** preliminary amendment.
16. ☐ A **SECOND** or **SUBSEQUENT** preliminary amendment.
17. ☐ A substitute specification.
18. ☐ A change of power of attorney and/or address letter.
19. ☐ A computer-readable form of the sequence listing in accordance with PCT Rule 13ter.2 and 35 U.S.C. 1.821 - 1.825.
20. ☐ A second copy of the published international application under 35 U.S.C. 154(d)(4).
21. ☐ A second copy of the English language translation of the international application under 35 U.S.C. 154(d)(4).
22. ☐ Certificate of Mailing by Express Mail
23. ☒ Other items or information:

Request for Consideration of Documents Cited in International Search Report

Request for Priority

PCT/IB/308

PCT/IB/304



214502US-0PCT

IN THE UNITED STATES PATENT & TRADEMARK OFFICE

IN RE APPLICATION OF :  
RINO MESSERE ET AL : ATTN: APPLICATION DIVISION  
SERIAL NO: NEW US PCT APPLN :  
(Based on PCT/FR00/01424)  
FILED: HEREWITH :  
FOR: TRANSPARENT GLAZING AND :  
ITS USE IN A DOOR OF A  
REFRIGERATED ENCLOSURE,  
ESPECIALLY ONE HAVING A  
VACUUM GLAZING UNIT

PRELIMINARY AMENDMENT

ASSISTANT COMMISSIONER FOR PATENTS  
WASHINGTON, D.C. 20231

SIR:

Prior to examination on the merits, please amend the above-identified application as follows:

IN THE CLAIMS

Please cancel Claim 13.

Please amend the claims as shown on the marked-up copy following this amendment to read as follows:

1. (Amended) A transparent glazing comprising at least one viewing area, wherein the viewing area is combined with an antifrosting absorbent layer deposited on at least one surface of said area.

TRANSPARENT GLAZING AND ITS USE IN A DOOR OF A  
REFRIGERATED ENCLOSURE, ESPECIALLY ONE HAVING A VACUUM  
GLAZING UNIT

5           The invention relates to a transparent glazing unit and its use in a door of a refrigerated enclosure and more particularly to a glazed door, the glazed area of which essentially consists of a vacuum glazing unit.

10           The invention will be more particularly described with reference to doors of refrigerated enclosures in which cold or frozen products are displayed, but the invention must not be construed as being limited to products or applications of this type. This is because the expression "transparent glazing"

15           mentioned above covers any type of glazing consisting of at least one glass sheet and/or of at least one sheet of a plastic which are intended for applications in the motor-vehicle industry, the building industry or the domestic electrical appliance industry.

20           When products preserved in a refrigerated enclosure have to remain visible, as is the case in many current commercial premises, the refrigerated enclosure is equipped with glazed parts which convert it into a refrigerated "display case", the usual name

25           for which is "refrigerated sales cabinet". There are several alternative forms of these "display cases". Some of them are in the form of a cabinet and then it is the door itself which is transparent, while others are in the form of chests and it is the horizontal lid

30           which is glazed in order to allow the contents to be seen.

          In these types of display cases, it is necessary for the merchandise to remain perfectly visible to customers so that it is possible to

35           preselect the merchandise without opening the "display case".

          When the usual insulating glazing is used, the insulation is not perfect and the temperature of the surface of the glass sheet in contact with the ambient

atmosphere is often below the temperature of the dew point, which may result in the phenomenon of condensation on this surface, affecting visibility.

5 The use of vacuum insulating glazing makes it possible to eliminate this drawback by providing very greatly enhanced insulation. Such insulation also has the advantage of reducing the energy costs.

10 The French patent application filed in the name of Saint-Gobain Vitrage under the number FR 97/09772 describes such a door of a refrigerated enclosure which includes a vacuum glazing unit. It thus proposes a door of a refrigerated enclosure essentially consisting of an insulating panel composed of at least two glass substrates between which a vacuum has been created, 15 which substrates are separated from each other by studs distributed over the entire surface and are joined around their periphery by an inorganic seal. In this way, the conventional insulating glazing units normally used are replaced with one insulating glazing unit 20 consisting of at least two glass sheets between which a vacuum has been created, which we will call hereafter vacuum insulating glazing. This type of vacuum insulating glazing has, for a total thickness markedly less than that of the conventional insulating glazing 25 units, substantially improved thermal insulation properties.

Furthermore, the structure of such a vacuum insulating glazing unit has the advantage of giving it a stiffness and a strength which are equivalent to 30 those of a single glazing unit of thickness equal to the sum of the thicknesses of the glass sheets, that is to say the glass sheets behave as a single sheet whose thickness is the sum of that of the two glass sheets. In this way, it is not necessary to combine this type 35 of glazing with a support frame. Thus, the overall size is greatly reduced and it is very simple to fit it into the environmental enclosure.

Such a door of a refrigerated enclosure, essentially consisting of a vacuum insulating glazing

unit, makes it possible to solve the problem of condensation on the external surface: this is because the thermal insulation of this glazing unit makes it possible to obtain an external surface at the ambient  
5 temperature.

On the other hand, this enhanced insulation means that the internal surface of the glazing or of the door is at the temperature of the refrigerated environment, something which accentuates the  
10 condensation phenomenon when the door is opened: the temperature of the internal surface is such that, in the case of freezer cabinets, frosting may be seen to form on the said surface.

The usual techniques for preventing the  
15 condensation and/or frosting which forms on the internal surface of the doors consist in blowing heated air over this surface. Whatever the technique used, the energy cost is high; the cost penalty is even greater in the case of a vacuum insulating glazing unit, the  
20 time required to remove the condensation and/or the frosting being longer. Moreover, this longer time due to the very low temperature of the internal face goes counter to the intended aim which consists in obtaining an almost permanent area of visibility, including after  
25 opening the door.

The objective of the invention is thus in particular to produce a door of a refrigerated enclosure which includes a glazed area consisting of an insulating glazing unit, in which the frosting liable  
30 to form on the viewing area when the door is opened can be rapidly and inexpensively removed.

This objective is achieved according to the invention by a transparent glazing unit having at least one viewing area, this area being combined with an  
35 antifrosting absorbent layer deposited on at least one surface of the said area.

The antifrosting function of the layer means that it inhibits the formation of water crystals.

Such a glazing unit, especially when it is an insulating glazing unit and more particularly a vacuum insulating glazing unit, can be used in a door of a refrigerated enclosure having at least one viewing area consisting, for example, of the said vacuum insulating glazing unit combined with an absorbent layer advantageously deposited on that surface of the said viewing area which is in contact with the refrigerated environment.

It has been shown that such a door, comprising the glazing according to the invention, makes it possible to prevent the frosting phenomenon, or more precisely to delay it or at the very least limit its appearance.

According to a first embodiment, the antifrosting absorbent layer is deposited directly on the glass, and more specifically on that surface of the vacuum insulating glazing unit which is in contact with the refrigerated environment. This is the surface in contact with the refrigerated environment when the door is in its closed position. Such a layer may be deposited by techniques of the sputtering or coating type, especially of the flow-coating or deep-coating type, the deposition being carried out before or after manufacturing of the vacuum glazing unit. Advantageously, an adhesion primer of the silane type is provided; it is either deposited beforehand on the glass or at the same time as the layer is formed, the silanes being introduced into the composition of the antifrosting absorbent layer.

According to a second embodiment, the antifrosting absorbent layer is deposited, for example according to one of the abovementioned methods, on a plastic film and the plastic film is itself fastened to the vacuum insulating glazing unit. The plastic film used is advantageously a polycarbonate film preferably having a thickness of less than 3 millimetres; this plastic is especially chosen for its mechanical strength properties. The plastic film is fastened to

the glazing in a sealed manner so that no trace of moisture can exist between the glass surface and the plastic film. It may be fastened, for example, by adhesive bonding around the periphery; the air layer possibly existing between the glass and the plastic film must then advantageously not exceed 3 mm. The fastening may also be achieved by means of an aluminium frame combined with a desiccant and an adhesive, similar to that for an insulating glazing unit of conventional construction; advantageously, the air layer between the glass and the plastic film then does not exceed 10 mm.

According to an advantageous embodiment of the invention, the antifrosting absorbent layer consists of at least one hydrophilic polymer. Such a polymer may be non-limitingly chosen from the following polymers: a polyvinylpyrrolidone of the poly(N-vinyl-2-pyrrolidone) or poly(1-vinylpyrrolidone) type, a polyvinylpyridine of the poly(N-vinyl-2-pyridine) type, of the poly(N-vinyl-3-pyridine) type or of the poly(N-vinyl-4-pyridine) type, a polyacrylate of the poly(2-hydroxyethyl acrylate) type, a polyacrylamide of the poly(N',N-hydroxyacrylamide) type, a polyvinyl acetate, a polyacrylonitrile, a polyvinyl alcohol, a polyacrolein, a polyethylene glycol or a polyoxyethylene. It may also be a copolymer based on two or more of the abovementioned polymers.

Preferably, the invention specifies that the layer consists of at least one crosslinked hydrophilic polymer. Crosslinking the polymer makes it possible, in particular, to obtain better cohesion of the layer and thus to prevent any risk of the layer being dissolved by water, over the long or short term.

According to a preferred embodiment of the invention, the hydrophilic polymer is combined with an organic or inorganic absorbent material, the said absorbent material preferably being porous.

An inorganic absorbent material especially improves the mechanical strength of the layer and more



particularly prevents the formation of scratches. The inorganic function is advantageously achieved by depositing a mesoporous material (CPG-MCM 41), such as TiO<sub>2</sub> nanoparticles, or by depositing orthosilicate hydrolysis condensation products, or other silicon derivatives.

An organic absorbent material especially allows retention of the hydrophilic polymer; a polyurethane is used, for example.

The inventors have thus been able to demonstrate that the presence of a porous layer which includes a hydrophilic polymer on the surface of the glazed area allows water to be absorbed. This principle prevents the formation of water droplets and thus the formation of a film liable to frost over and affect visibility through the glazed area. The choice of hydrophilic polymer and of the porosity in the case of a porous absorbent material make it possible to control the antifrosting behaviour of the layer. In particular, increasing the porosity allows the rate of water absorption and the water absorptivity, as well as the level of water in microdroplet form, to be controlled.

According to a preferred embodiment of the invention, the porosity of the layer is between 0.1 and 1000 cm<sup>3</sup>/g. In the case of a polymeric material, it is advantageously between 0.1 and 100 cm<sup>3</sup>/g and preferably less than 20 cm<sup>3</sup>/g. It is preferably between 200 and 1000 cm<sup>3</sup>/g in the case of a mesoporous material. The porosity defines the void volume of the pores per unit mass of the layer.

Also preferably, the layer has pores whose mean diameter is between 0.05 and 50 microns, preferably between 0.1 and 20 microns and more preferably between 1 and 15 microns. The shapes of the cavities making up the pores are oval or spherical.

Whatever the nature of the antifrosting absorbent layer and the method of producing the latter, it advantageously has a thickness of less than 100 microns, preferably less than 50 microns and more

preferably less than 35 microns and, in some cases, preferably less than 25 microns and more preferably less than 20 microns.

Further details and advantageous characteristics of the invention will emerge below from the description of illustrative examples of the invention and of tests carried out.

As described above, a door or a refrigerated sales cabinet was produced. It consists especially of a vacuum insulating glazing unit in order to form the viewing area and of a door frame, for example made of metal. This frame may especially support all the mechanical systems of the handle and hinge type, as well as the seals which seal against the walls of the refrigerated enclosure.

The insulating glazing unit consists of two glass sheets between which a vacuum has been created. The glass sheets are separated from each other by studs distributed over the entire surface of the glazing and are joined together around their periphery by a seal of inorganic adhesive. Such a vacuum insulation glazing unit is, for example, produced according to a technique as described in Patent Application EP 645 516.

According to the invention, a polycarbonate film having a thickness of 2 millimetres is fastened to the vacuum insulating glazing unit by means of an adhesive forming a strip with a thickness of 1 millimetre around the periphery of the glazing. Thus, an air cavity is formed between the glazing and the completely sealed polycarbonate film. This complex is produced in such a way that the trapped air is dry. The film is fastened to that side of the vacuum insulating glazing unit which is intended to face the inside of the refrigerated enclosure when the door is in its closed position.

Before attaching it, the polycarbonate film is coated with an antifrosting absorbent layer, this being deposited so as to face the inside of the refrigerated enclosure when the door is in the closed position. The

layer thus deposited forms a polymeric porous three-dimensional network based on polyvinylpyrrolidone and polyurethane.

Measurements were carried out on the layer in the wet state using transmission electromicroscopy; these measurements allow the thickness of the layer and the size of the pores to be checked. The thickness of the layer is equal to 14.5 microns and the pores have a mean diameter varying from 1 to 8 microns.

Tests were carried out on various types of doors. These doors are fitted onto refrigerated sales cabinets within which a temperature of  $-28^{\circ}\text{C}$  is maintained. The cabinets themselves are placed in an atmosphere at a temperature of  $25^{\circ}\text{C}$ . The tests consist in opening the door for a period of 3 minutes and a period of 12 seconds. The 3-minute period simulates the average time needed for this type of cabinet to be stocked up in the morning. The 12-second duration simulates the average time needed for a consumer to take one or more products.

The measured results are the times needed for satisfactory visibility through the door to return, that is to say the times needed to remove the condensation and/or frosting.

The first door tested, A, has an insulating glazing unit consisting of three glass sheets. The second door tested, B, has a vacuum insulating glazing unit.

The third door, C, is that according to the invention that has just been described.

The results are given in the table below:

	3-min opening	12-s opening
A	8 min 20 s	1 min 15 s
B	31 min 10 s	1 min 40 s
C	0 s	0 s

From these results it is clearly apparent that door C, produced according to the invention, prevents the formation of frosting.

Another test was carried out under similar conditions. Only the nature of the layer differs in this second example. This second example consisted in depositing a layer consisting only of a hydrophilic polymer; this hydrophilic polymer was based on polyvinylpyrrolidone, having a molecular mass of 1,300,000 g/mol and diluted to 10% by mass in ethanol. The composition thus obtained was then deposited on the glass by flow coating.

Tests such as those described above, consisting in opening the door for a period of 12 seconds and for 3 minutes, were carried out. In both cases, there was no sign of any frosting on the viewing area of the door.

The presence of the absorbent layer therefore prevents the formation of frosting when the door is opened under normal operating conditions.

CLAIMS

1. Transparent glazing having at least one viewing area, characterized in that the viewing area is  
5 combined with an antifrosting absorbent layer deposited on at least one surface of the said area.
2. Glazing according to Claim 1, characterized in that the layer is deposited on the surface of the glazing.
- 10 3. Glazing according to Claim 1, characterized in that the layer is deposited on a plastic film and in that the plastic film is fastened to the glazing.
4. Glazing according to one of Claims 1 to 3, characterized in that the layer consists of at least  
15 one hydrophilic polymer.
5. Glazing according to Claim 4, characterized in that the hydrophilic polymer is crosslinked.
6. Glazing according to either of Claims 4 and 5, characterized in that the hydrophilic polymer is a  
20 polymer or copolymer of vinylpyrrolidone.
7. Glazing according to one of Claims 4 to 6, characterized in that the layer includes an organic or inorganic, and preferably porous, absorbent material.
8. Glazing according to one of the preceding  
25 claims, characterized in that the layer in the wet state has a porosity of between 0.1 and 1000 cm<sup>3</sup>/g.
9. Glazing according to one of the preceding claims, characterized in that the layer in the wet state has pores whose diameter is between 0.05 and 50  
30 microns, preferably between 0.1 and 20 microns and more preferably between 1 and 15 microns.
10. Glazing according to one of the preceding claims, characterized in that the antifrosting absorbent layer has a thickness of less than 100  
35 microns.
11. Glazing according to one of Claims 1 to 10, characterized in that the glazing is an insulating glazing unit consisting of at least two glass sheets.

12. Glazing according to Claim 11, characterized in that the glazing is a vacuum insulating glazing unit.

13. Use of the glazing according to one of Claims 1 to 12 in a door of a refrigerated enclosure.

5 14. Use of the glazing according to Claim 13, characterized in that the antifrosting absorbent layer is deposited on that surface of the viewing area which is in contact with the refrigerated environment.

950'2 300'7

PATENT

**TRANSPARENT GLAZING AND ITS USE IN A DOOR OF A  
REFRIGERATED ENCLOSURE, ESPECIALLY ONE HAVING A VACUUM  
GLAZING UNIT**

ABSTRACT

The subject of the invention is a transparent glazing unit having at least one viewing area and its use in a door of a refrigerated enclosure and more particularly a glazed door, the glazed area of which essentially consists of a vacuum glazing unit.

According to the invention the viewing area is combined with an antifrosting absorbent layer deposited on at least one surface of the said area.

6099660

# Declaration and Power of Attorney for Patent Application

## Déclaration et Pouvoirs pour Demande de Brevet

### French Language Declaration

En tant l'inventeur nommé ci-après, je déclare par le présent acte que:

Mon domicile, mon adresse postale et ma nationalité sont ceux figurant ci-dessous à côté de mon nom.

Je crois être le premier inventeur original et unique (si un seul nom est mentionné ci-dessous), ou l'un des premiers co-inventeurs originaux (si plusieurs noms sont mentionnés ci-dessous) de l'objet revendiqué, pour lequel une demande de brevet a été déposée concernant l'invention intitulée

et dont la description est fournie ci-joint à moins

- ☐ ci-joint
- ☐ a été déposée le \_\_\_\_\_

sous le numéro de demande des Etats-Unis ou le numéro de demande international PCT

\_\_\_\_\_ et modifiée le \_\_\_\_\_  
 \_\_\_\_\_ (le cas échéant).

Je déclare par le présent acte avoir passé en revue et compris le contenu de la description ci-dessus, revendications comprises, telles que modifiées par toute modification dont il aura été fait référence ci-dessus.

Je reconnais devoir divulguer toute information pertinente à la brevetabilité, comme défini dans le Titre 37, § 1.56 du Code fédéral des réglementations.

As a below named inventor, I hereby declare that:

My residence, mailing address and citizenship are as stated next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled.

TRANSPARENT GLAZING AND USE THEREOF IN A CHILLING CHAMBER DOOR COMPRISING IN PARTICULAR A GLAZING UNDER VACUUM (as amended)

the specification of which

- ☐ is attached hereto.
- ☒ was filed on 26 November 2001

as United States Application Number or PCT International Application Number

09/926,609 and was amended on \_\_\_\_\_  
 \_\_\_\_\_ (if applicable)

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, § 1.56.



## French Language Declaration

Je revendique par le présent acte avoir la priorité étrangère, en vertu du Titre 35, § 119(a)-(d) ou § 365(b) du Code des Etats-Unis, sur toute demande étrangère de brevet ou certificat d'inventeur ou, en vertu du Titre 35, § 365(a) du même Code, sur toute demande internationale PCT désignant au moins un pays autre que les Etats-Unis et figurant ci-dessous et, en cochant la case, j'ai aussi indiqué ci-dessous toute demande étrangère de brevet, tout certificat d'inventeur ou toute demande internationale PCT ayant une date de dépôt précédant celle de la demande à propos de laquelle une priorité est revendiquée.

Prior Foreign Application(s)  
Demande(s) de brevet antérieure(s) dans un autre pays.

<u>99 06586</u>	<u>France</u>
(Number)	(Country)
(Numéro)	(Pays)
<u>                    </u>	<u>                    </u>
(Number)	(Country)
(Numéro)	(Pays)

Je revendique par le présent acte tout bénéfice, en vertu du Titre 35, § 119(e) du Code des Etats-Unis, de toute demande de brevet provisoire effectuée aux Etats-Unis et figurant ci-dessous.

<u>                    </u>	<u>                    </u>
(Application No.)	(Filing Date)
(N° de demande)	(Date de dépôt)

Je revendique par le présent acte tout bénéfice, en vertu du Titre 35, § 120 du Code des Etats-Unis, de toute demande de brevet effectuée aux Etats-Unis, ou en vertu du Titre 35, § 365(c) du même Code, de toute demande internationale PCT désignant les Etats-Unis et figurant ci-dessous et, dans la mesure où l'objet de chacune des revendications de cette demande de brevet n'est pas divulgué dans la demande antérieure américaine ou internationale PCT, en vertu des dispositions du premier paragraphe du Titre 35, § 112 du Code des Etats-Unis, je reconnais devoir divulguer toute information pertinente à la brevetabilité, comme défini dans le Titre 37, § 1.56 du Code fédéral des réglementations, dont j'ai pu disposer entre la date de dépôt de la demande antérieure et la date de dépôt de la demande nationale ou internationale PCT de la présente demande:

<u>PCT/FR00/01424</u>	<u>25 May 2000</u>
(Application No.)	(Filing Date)
(N° de demande)	(Date de dépôt)
<u>                    </u>	<u>                    </u>
(Application No.)	(Filing Date)
(N° de demande)	(Date de dépôt)

Je déclare par le présent acte que toute déclaration ci-incluse est, à ma connaissance, véridique et que toute déclaration formulée à partir de renseignements ou de suppositions est tenue pour véridique; et de plus, que toutes ces déclarations ont été formulées en sachant que toute fausse déclaration volontaire ou son équivalent est passible d'une amende ou d'une incarcération, ou des deux, en vertu de la § 1001 du Titre 18 du Code des Etats-Unis, et que de telles déclarations volontairement fausses risquent de compromettre la validité de la demande de brevet ou du brevet délivré à partir de celle-ci.

I hereby claim foreign priority under Title 35, United States Code, § 119 (a)-(d) or 365(b) of any foreign application(s) for patent or inventor's certificate, or § 365(a) of any PCT International application which designated at least one country other than the United States, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or PCT International application having a filing date before that of the application on which priority is claimed.

Priority Claimed  
Droit de priorité  
Revendiqué

<u>25 May 1999</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
(Day/Month/Year Filed)	Yes	No
(Jour/Mois/Année de dépôt)	Oui	Non
<u>                    </u>	<input type="checkbox"/>	<input type="checkbox"/>
(Day/Month/Year Filed)	Yes	No
(Jour/Mois/Année de dépôt)	Oui	Non

I hereby claim the benefit under Title 35, United States Code, §119(e) of any United States provisional application(s) listed below.

<u>                    </u>	<u>                    </u>
(Application No.)	(Filing Date)
(N° de demande)	(Date de dépôt)

I hereby claim the benefit under Title 35, United States Code, § 120 of any United States application(s), or § 365(c) of any PCT International application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of Title 35, United States Code, § 112, I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, § 1.56 which became available between the filing date of the prior application and the national or PCT International filing date of this application.

<u>                    </u>
(Status: Patented, Pending, Abandoned)
(Statut : breveté, en cours d'examen, abandonné)
<u>                    </u>
(Status: Patented, Pending, Abandoned)
(Statut : breveté, en cours d'examen, abandonné)

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

## French Language Declaration

POUVOIRS: En tant que l'inventeur cité, je désigne par la présente l'(les) avocat(s) suivant(s) pour qu'ils poursuive(nt) la procédure de cette demande de brevet et traite(nt) toute affaire s'y rapportant avec l'Office des brevets et des marques: (mentionner le nom et le numéro d'enregistrement).

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith: (list name and registration number)



**022850**

Addresser toute correspondance à:

Send Correspondence to:



**022850**

Adresser tout appel téléphonique à:  
(nom et numéro de téléphone)

Direct Telephone calls to: (name and telephone number)

**(703) 413-3000**

Nom complete de l'unique ou premier inventeur	Full name of sole or first inventor Rino MESSERE	
Signature de l'inventeur	Date	Inventor's signature  Date 03/12/2002
Domicile	Residence 32, rue du Bois Rosine, B-4577 Modave, Belgium	
Nationalité	Citizenship Belgium	
Adresse Postale	Mailing Address same as above	

Nom complete du second co-inventeur, le cas echean	Full name of second joint inventor, If any Anne-Sophie HEBERT	
Signature de l'inventeur	Datum	Second inventor's signature  Date 01/03/2002
Domicile	Residence 15, rue de l'Oise, F-60200 Compiègne, France	
Nationalité	Citizenship France	
Adresse Postale	Mailing Address same as above	

(Fournir les mêmes renseignements et la signature du troisième co-inventeur et de tout co-inventeur supplémentaire.)

(Supply similar information and signature for third and subsequent joint inventors.)

## French Language Declaration

Nom complet du troisième co-inventeur, le cas échéant	Full name of third joint inventor, If any Jean-Michel FLORENTIN
Signature de l'inventeur <span style="float: right;">Date</span>	Third inventor's signature <span style="float: right;">Date</span> 01/03/2002
Domicile	Residence Boite postale 1, F-77260 La Ferte Sous Jouarre, France
Nationalité	Citizenship France
Adresse Postale	Mailing Address same as above

Nom complet du quatrième co-inventeur, le cas échéant	Full name of fourth joint inventor, If any
Signature de l'inventeur <span style="float: right;">Date</span>	Fourth inventor's signature <span style="float: right;">Date</span>
Domicile	Residence
Nationalité	Citizenship
Adresse Postale	Mailing Address

Nom complet du cinquième co-inventeur, le cas échéant	Full name of fifth joint inventor, If any
Signature de l'inventeur <span style="float: right;">Date</span>	Fifth inventor's signature <span style="float: right;">Date</span>
Domicile	Residence
Nationalité	Citizenship
Adresse Postale	Mailing Address

Nom complet du sixième co-inventeur, le cas échéant	Full name of sixth joint inventor, If any
Signature de l'inventeur <span style="float: right;">Date</span>	Sixth inventor's signature <span style="float: right;">Date</span>
Domicile	Residence
Nationalité	Citizenship
Adresse Postale	Mailing Address

(Fournir les mêmes renseignements et la signature du septième co-inventeur et de tout co-inventeur supplémentaire.)

(Supply similar information and signature for seventh and subsequent joint inventors.)